

Search Plan and Results

Question

To what extent are recently developed technological materials that are designed to improve food safety effective in reducing exposure to pathogens and decreasing the risk of foodborne illnesses in the home? (DGAC 2010)

Date Searched

8/27/09, 10/15/09 and 10/16/09

Inclusion Criteria

- January 2004 to August 2009
- Human subjects
- English language
- *Sample size:* Minimum of 10 subjects per study arm; preference for larger sizes, if available
- *Dropout rate:* Less than 20%; preference for smaller dropout rates
- Ages two years and older; look at research for adults and children, pregnant women and elderly
- *Populations:* Healthy and those at elevated risk of adverse outcome from food borne illness (Pregnant women and unborn baby (fetus), young children (65 years old), those with weakened immune systems (cancer, leukemia, diabetes, liver or kidney disease, HIV/AIDS, autoimmune disease (e.g., lupus)), persons with poor underlying health.

Exclusion Criteria

- International studies
- Medical treatment and therapy
- Diseased subjects (already diagnosed with disease related to study purpose)
- Malnourished or third-world populations or disease incidence not relative to US population (e.g., malaria)
- Animal studies
- In vitro studies
- Articles not peer reviewed (websites, magazine articles, Federal reports, etc.)
- Articles focusing on food industry or commercial applications.

Search Terms: Search Vocabulary

For 8/27/09 Search:

Search Terms:

("Food Contamination/prevention and control"[Mesh] OR "Equipment Contamination/prevention and control"[Mesh]) AND "food technology"[mh] AND (thermometer* OR ((antimicrobial OR anti-bacterial) AND (cutting board* OR sponge* OR wipes OR countertop* OR cloth* OR spray* OR clean* OR sanitizer*)))

("Food Contamination/prevention and control"[Mesh] OR "Equipment Contamination/prevention and control"[Mesh] OR "food technology"[mh]) AND

"Anti-Bacterial Agents"[Mesh] AND (home OR domestic OR kitchen OR consumer[title])

("Food Contamination/prevention and control"[Mesh] OR "Equipment Contamination/prevention and control"[Mesh]) AND "food technology"[mh] AND ("food packaging"[mh] OR "food preservation"[mh]) AND (home OR domestic OR kitchen OR consumer[title])

("Food Contamination/prevention and control"[Mesh] OR "Equipment Contamination/prevention and control"[Mesh]) AND "food technology"[mh] AND ("food packaging"[mh])

"food packaging"[mh] AND (bacteriostatic OR bactericidal)

food technology thermometers

kitchen disinfectants

food wash*

("food packaging"[mh] OR "food preservation"[mh]) AND (shelf life) AND (consumer* OR home OR domestic OR household*)

("food packaging"[mh] OR "food preservation"[mh]) AND (shelf life) AND (consumer* OR home OR domestic OR household*)

For 10/15/09 Search:

BIOSIS, CAB Abstracts, FSTA, AGRICOLA:

Search terms:

(effective* OR efficacy)AND (thermometer* OR ((antimicrobial OR antibacterial OR anti-microbial OR anti-bacterial) AND ((cutting adj board?) OR sponge? OR wipe? OR countertop? OR sanitizer?)))

From 10/16/2009 Search:

Search in BIOSIS, CAB Abstracts, FSTA, AGRICOLA:

Search terms:

(effective* OR efficacy)AND (thermometer* OR ((antimicrobial OR antibacterial OR anti-microbial OR anti-bacterial) AND ((cutting adj board?) OR sponge? OR wipe? OR countertop? OR sanitizer?))) 163 7 selected

Updated PubMed search using (effective* OR efficacy) AND ((antimicrobial OR antibacterial OR anti-microbial OR anti-bacterial) AND ((cutting board*) OR sponge* OR wipe* OR countertop* OR sanitizer*)) 161 hits 24 selected (including those found in webspirs search)

Electronic Databases

PubMed.

BIOSIS, CAB Abstracts, FSTA, AGRICOLA Databases

Total hits from all electronic database searches: 952

Total articles identified to review from electronic databases: 24

Articles Identified Via Handsearch or Other Means

Summary of Articles Identified to Review

Number of Primary Articles Identified: 8

Number of Review Articles Identified: 0

Total Number of Articles Identified: 8

Number of Articles Reviewed but Excluded: 16

List of Articles Included for Evidence Analysis

DeVere E, Purchase D. Effectiveness of domestic antibacterial products in decontaminating food contact surfaces. *Food Microbiol.* 2007 Jun; 24(4): 425-430. Epub 2006 Sep 27. PMID: 17189769.

Kounosu M, Kaneko S. Antibacterial activity of antibacterial cutting boards in household kitchens. *Biocontrol Sci.* 2007 Dec; 12(4): 123-130. PMID: 18198718.

LeBlanc DI, Goguen B, Dallaire R, Taylor M, Ryan D, Klassen M. Evaluation of thermometers for measuring the cooking temperature of meat. *Food Protection Trends.* 2005; 25(6): 442-449. (FSTA and SCOPUS CITATION).

Liu MN, Vinyard B, Callahan JA, Solomon MB. Accuracy, precision and response time of consumer bimetal and digital thermometers for cooked ground beef patties and chicken breasts. *Journal of Muscle Foods.* 2009; 20(2): 138-159. (Include: Related to evaluating different types of meat thermometers for in-home use; SCOPUS citation.)

Liu MN, Vinyard B, Callahan JA, Solomon MB. Accuracy, precision and response time of consumer fork, remote, digital probe and disposable indicator thermometers for cooked ground beef patties and chicken breasts. *J. Muscle Foods.* 2009; 20(2): 160-185. (SCOPUS citation).

McCurdy SM, Mayes E, Hillers V, Kang DH, Edelfsen M. Availability, accuracy and response time of instant-read food thermometers for consumer use. *Food Prot. Trends.*

2004; 24(12): 961-968. (SCOPUS and FSTA citation).

McKee LH, Neish L, Pottenger A, Flores N, Weinbrenner K, Remmenga M. Evaluation of consumable household products for decontaminating retail skinless, boneless chicken breasts. *J Food Prot.* 2005 Mar; 68(3): 534-537. PMID: 15771178.

Yucel Sengun I, Karapinar M. Effectiveness of household natural sanitizers in the elimination of *Salmonella typhimurium* on rocket (*Eruca sativa* Miller) and spring onion (*Allium cepa* L.). *Int J Food Microbiol.* 2005 Feb 15; 98(3): 319-323. PMID: 15698693.

List of Excluded Articles with Reason

Article	Reason for Exclusion
Brown JM, Avens JS, Kendall PA, Hyatt DR, Stone MB. Survey of consumer attitudes and the effectiveness of hand cleansers in the home. <i>Food Protection Trends.</i> 2007; 27(8): 603-611.	Narrative review.
Byrd-Bredbenner C, Maurer J, Wheatley V, Cottone E, Clancy M. Food safety hazards lurk in the kitchens of young adults. <i>J Food Prot.</i> 2007 Apr; 70(4): 991-996. PMID: 17477272.	Abstracted for another food safety question.
Cagri A, Ustunol Z, Ryser ET. Antimicrobial edible films and coatings. <i>J Food Prot.</i> 2004 Apr; 67(4): 833-848. Review. PMID: 15083740.	Narrative review.
Cooksey K. Effectiveness of antimicrobial food packaging materials. <i>Food Addit Contam.</i> 2005 Oct; 22(10): 980-987. PMID: 16227182.	Narrative review.
Galic K, Curic D, Gabric D. Shelf life of packaged bakery goods: A review. <i>Crit Rev Food Sci Nutr.</i> 2009 May; 49(5): 405-426. Review. PMID: 19399669.	Narrative review.
Meadows E, Le Saux N. A systematic review of the effectiveness of antimicrobial rinse-free hand sanitizers for prevention of illness-related absenteeism in elementary school children. <i>BMC Public Health.</i> 2004 Nov 1; 4: 50. Review. PMID: 15518593; PMCID: PMC534108.	Abstracted for hand sanitation question.
McCurdy SM, Hillers V, Cann SE. Consumer reaction and interest in using food thermometers when cooking small or thin meat items. <i>Food Protection Trends.</i> 2005; 25(11): 826-831.	Qualitative study.

<p>McCurdy SM, Takeuchi MT, Edwards ZM, Edlefsen M, Dong-Hyun K, Mayes VE, Hillers VN. Food safety education initiative to increase consumer use of food thermometers in the United States. <i>British Food Journal</i>. 2006; 108(9): 775-794.</p>	<p>Food safety education study.</p>
<p>Olivas GI, Barbosa-Cánovas GV. <u>Edible coatings for fresh-cut fruits</u>. <i>Crit Rev Food Sci Nutr</i>. 2005;45(7-8):657-70. Review. PMID: 16371333.</p>	<p>Narrative review.</p>
<p>Ovca A, Jevšnik M. <u>Maintaining a cold chain from purchase to the home and at home: Consumer opinions</u>. <i>Food Control</i>. February 2009; 20(2): 167-172.</p>	<p>Does not answer question (focus is on consumer understanding of "cold chain" in food safety).</p>
<p>Raybaudi-Massilia RM, Mosqueda-Melgar J, Soliva-Fortuny R, Martin-Belloso O. Control of pathogenic and spoilage microorganisms in fresh-cut fruits and fruit juices by traditional and alternative natural antimicrobials. <i>Comprehensive Reviews in Food Science and Food Safety</i>. 2009; 8(3): 157-180.</p>	<p>Narrative review.</p>
<p>Smith JP, Daifas DP, El-Khoury W, Koukoutsis J, El-Khoury A. <u>Shelf life and safety concerns of bakery products: A review</u>. <i>Crit Rev Food Sci Nutr</i>. 2004; 44(1): 19-55. Review. PMID: 15077880.</p>	<p>Narrative review.</p>
<p>Tiwari BK, Valdramidis VP, O'Donnell CP, Muthukumarappan K, Bourke P, Cullen PJ. <u>Application of natural antimicrobials for food preservation</u>. <i>J Agric Food Chem</i>. 2009 Jul 22; 57(14): 5, 987-6, 000. PMID: 19548681.</p>	<p>Narrative review.</p>
<p>Vessey JA, Sherwood JJ, Warner D, Clark D. <u>Comparing hand washing to hand sanitizers in reducing elementary school students' absenteeism</u>. <i>Pediatr Nurs</i>. 2007 Jul-Aug; 33(4): 368-372. PMID: 17907739.</p>	<p>Abstracted for hand sanitation question.</p>
<p>Wanyanya I, Muyanja C, Nasinyama GW. <u>Kitchen practices used in handling broiler chickens and survival of <i>Campylobacter spp.</i> on cutting surfaces in Kampala, Uganda</u>. <i>J Food Prot</i>. 2004 Sep; 67(9): 1, 957-1, 960. PMID: 15453589.</p>	<p>Study in third world country.</p>
<p>Williams GJ, Denyer SP, Hosein IK, Hill DW, Maillard JY. <u>The development of a new three-step protocol to determine the efficacy of disinfectant wipes on surfaces contaminated with <i>Staphylococcus aureus</i></u>. <i>J Hosp Infect</i>. 2007 Dec; 67(4): 329-335. Epub 2007 Oct 18. PMID: 17945392.</p>	<p>Does not answer question (focus is on testing protocol to determine efficacy of disinfectant wipes).</p>

